

**NORTH CAROLINA DIVISION OF  
AIR QUALITY**

## Application Review

**Issue Date:** XX/XX/2018

**Region:** Raleigh Regional Office  
**County:** Person  
**NC Facility ID:** 7300079  
**Inspector's Name:** Maureen Conner  
**Date of Last Inspection:** 12/19/2017  
**Compliance Code:** 3 / Compliance - inspection

<b>Facility Data</b>				<b>Permit Applicability (this application only)</b>			
<p><b>Applicant (Facility's Name):</b> Republic Services of North Carolina, LLC dba Upper Piedmont Environmental Landfill</p> <p><b>Facility Address:</b>          Republic Services of North Carolina, LLC dba          Upper Piedmont Environmental Landfill          9650 Oxford Road          Rougemont, NC 27572</p> <p><b>SIC:</b> 4953 / Refuse Systems  <b>NAICS:</b> 562212 / Solid Waste Landfill</p> <p><b>Facility Classification: Before:</b> Title V <b>After:</b> Title V  <b>Fee Classification: Before:</b> Title V <b>After:</b> Title V</p>				<p><b>SIP:</b> 15A NCAC 02D .0516, 02D .0521, 02D .0524, 02D .1110, 02D .1111, 02D .1806, 02Q .0513  <b>NSPS:</b> Subpart WWW  <b>NESHAP:</b> 40 CFR 61 Subpart M, 40 CFR 63 Subpart AAAA  <b>PSD:</b> N/A  <b>PSD Avoidance:</b> N/A  <b>NC Toxics:</b> N/A  <b>112(r):</b> N/A  <b>Other:</b></p>			
<b>Contact Data</b>				<b>Application Data</b>			
<b>Facility Contact</b>  Chris Gustin Operations Manager (336) 390-1301 9650 Oxford Road Rougemont, NC 27572		<b>Authorized Contact</b>  Drew Isenhour Area President (828) 464-7748 1041 Red Venture Road Fort Mill, SC 29707		<b>Technical Contact</b>  Matt Einsmann, P.E. Environmental Manager (919) 354-3227 5111 Chin Page Road Durham, NC 27703		<p><b>Application Number:</b> 7300079.18A  <b>Date Received:</b> 06/01/2018  <b>Application Type:</b> Renewal  <b>Application Schedule:</b> TV-Renewal</p> <p style="text-align: center;"><b>Existing Permit Data</b></p> <p><b>Existing Permit Number:</b> 09847/T02  <b>Existing Permit Issue Date:</b> 02/08/2018  <b>Existing Permit Expiration Date:</b> 02/28/2019</p>	
<b>Total Actual emissions in TONS/YEAR:</b>							
CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2016	1.45	14.09	5.31	64.24	3.45	3.23	1.60 [Hydrogen chloride (hydrochlori]
2015	1.14	11.09	5.04	60.33	2.72	2.81	1.26 [Hydrogen chloride (hydrochlori]
2014	1.0000	9.75	4.77	53.05	2.39	2.57	1.11 [Hydrogen chloride (hydrochlori]
2013	0.9300	8.90	4.52	48.42	2.18	2.41	1.02 [Hydrogen chloride (hydrochlori]
2012	0.8900	8.56	4.27	46.57	2.10	2.24	0.9834 [Hydrogen chloride (hydrochlori]
<p><b>Review Engineer:</b> Joshua L. Harris</p> <p><b>Review Engineer's Signature:</b>                      <b>Date:</b></p>				<p style="text-align: center;"><b>Comments / Recommendations:</b></p> <p><b>Issue</b> 09847/T03  <b>Permit Issue Date:</b> XX/XX/2018  <b>Permit Expiration Date:</b> XX/XX/2023</p>			

## **1. Purpose of Application**

Republic Services of North Carolina, LLC dba Upper Piedmont Environmental Landfill is an existing Municipal Solid Waste (MSW) landfill owned and operated by Republic Services of North Carolina, LLC, and is located in Rougemont, Person County. The facility timely submitted application number 7300079.18A, and has requested renewal of the current air permit with no modifications. The application will go through the 30-day public notice and 45-day EPA review periods prior to issuance.

The facility contact for the application is Matt Einsmann, Environmental Manager, (919-354-3227). The permit application was prepared by BEL Environmental Engineering, LLC. The contact at BEL is Jennifer Baker, Director of Environmental Compliance, (734-207-7895).

## **2. Facility Description**

The Upper Piedmont Environmental Landfill is an active MSW landfill operating under Solid Waste Permit No. 7304. The landfill was originally opened in 1997, and accepts waste from various counties within a 60-mile radius of the facility, including Durham County, Vance County, and from the State of Virginia. The landfill covers approximately 976 acres, and accepts approximately 660 tons of waste per day, or 240,900 tons of waste annually. The facility meets the daily cover requirements of the Solid Waste permit, and periodically uses a proprietary material called “Posi-Shell” that is mixed with water and is blown onto the working face of the landfill for alternate daily cover. This material forms a thin coat of concrete-like material that helps protect the fill from wind, replaces the daily soil cover that takes up much more volume, and uses an additive to help further reduce odors. An intermediate cover of soil is placed over the waste material when the crew moves temporarily on to another portion of the landfill, and the soil is seeded to provide short-term vegetative cover. Typically, each layer of new waste is compacted to approximately 12 feet before the crew moves onto a new area. Within approximately 12 months, another 12-foot lift may be added again to that same cell. In this way, all the cells in the landfill rise together. The facility also operates a number of portable sources, powered by diesel-fired engines, which are categorically exempt under 15A NCAC 02Q .0503(7)(a).

## **3. Facility History/Application Chronology**

- 01/09/09 First time Title V permit, number 09847T00, issued.
- 03/03/14 Permit revision 09847T01 issued for renewal.
- 02/08/18 Permit revision 09847/T02 issued for a Minor Modification to remove the 2,000 scfm flare (ID No. CD-01), and install a 3,000 scfm flare (ID No. CD-02).
- 06/01/18 The Raleigh Central Office (RCO) received the renewal application (Application No. 7300079.18A).
- 06/01/18 RCO sent the facility a letter acknowledging receipt of the permit application, the letter requested that the facility submit two additional copies of the application since only one copy was received.

06/04/18 RCO received the requested copies of the application, and forwarded a copy to the Raleigh Regional Office (RRO). The application was considered complete for processing on June 4, 2018.

07/18/18 Joshua Harris, RCO DAQ, sent Jennifer Baker an email with a question regarding the concentrations used to estimate H<sub>2</sub>S emissions from the landfill. 100 ppmv and 400 ppmv were respectively used for the flare and landfill volume emission calculations.

07/19/18 Joshua Harris received a response from Jennifer Baker. Ms. Baker stated that 100 ppmv was the correct concentration to use.

07/19/18 Joshua Harris sent electronic copies of the draft permit and review documents to Booker Pullen, RCO, and Charles McEachern, RRO, for comments.

07/23/18 Joshua Harris received comments on the draft documents from Charles McEachern. Mr. McEachern requested that portable/mobile sources not be included in the insignificant activities list since these sources are categorically exempt, and not exempt under 15A NCAC 02Q .0503(8).

07/27/18 Joshua Harris received comments from Booker Pullen containing minor edits.

07/30/18 Joshua Harris sent electronic copies of the draft permit and review to Matt Einsmann and Jennifer Baker for comments.

08/08/18 Joshua Harris sent a follow-up email to Matt Einsmann requesting comments on the previously sent documents.

08/14/18 Joshua Harris spoke with Jennifer Baker regarding comments from the facility. Mr. Einsmann responded to previous requests via email on August 3, 2018, but those responses were not received by Mr. Harris due to apparent technical difficulty. Ms. Baker forwarded minor editorial comments made on the review document by Mr. Einsmann. There were no comments on the draft permit.

08/15/18 30-day public notice and 45-day EPA review periods begin.

Xx/xx/18 Public notice period ends.

Xx/xx/18 EPA review period ends.

Xx/xx/18 Air Quality Permit Revision No. 09847T03 issued.

#### 4. Table of Changes to Existing Permit No. 09847T02

Existing Page(s)	New Page(s)	Section	Description of Changes
Cover and throughout	Cover and throughout	--	Updated all dates and permit revision numbers.
Cover	Cover	--	Updated PSD tracking statement.
3	3	Emission Source Table	<ul style="list-style-type: none"> <li>Added label for applicability of 40 CFR 61, Subpart M</li> <li>Removed footnote referring to CD-02 being part of a Minor Modification.</li> </ul>
3	3	Summary Table	<ul style="list-style-type: none"> <li>Reorganized table in order of regulation number.</li> <li>Added Asbestos as regulated pollutant.</li> </ul>
11	4	2.1 A.1.	Moved the sulfur dioxide emissions from combustion sources section (15A NCAC 02D .0516).
11-12	4	2.1 A.2.	Moved the control of visible emissions section (15A NCAC 02D .0521).
4-10	4-11	2.1 A.3.	Referenced to the requirements in the permit instead of referring to the federal codes throughout this condition.
N/A	4-5	2.1 A.3.b-e.	Inserted the “Standards for Air Emissions from Municipal Solid Waste Landfills” section.
N/A	6	2.1 A.3.g.i.	Inserted actual equation required to calculate NMOC emissions.
5	N/A	2.1 A.3.d.	Removed the conditions specific to the first 180 days after gas collection system startup.
N/A	6	2.1 A.3.g.v.	Added a reporting condition when the facility chooses to operate at a higher operation value at specific wells.
4	8	2.1 A.3.l.	<ul style="list-style-type: none"> <li>Moved the testing conditions to be after the compliance provisions.</li> <li>Added noncompliance language.</li> </ul>
9	N/A	2.1 A.3.h.	Removed well closure section since it is covered under section 2.1 A.3.f.ii.(C).
9	N/A	2.1 A.1.i.ii.	Removed the initial annual report and the initial performance test conditions.
N/A	11	2.1 A.3.x.	Added the landfill closure reporting requirement.
N/A	11	2.1 A.3.y.	Added the reporting requirement prior to removing of control equipment.
12	15	2.1 A.6.	Moved 15A NCAC 02D .1806 to the end of the section.
N/A	11-13	2.1 A.4.	Inserted permit condition containing work practice requirements for disposal of asbestos-containing wastes under 40 CFR 61, Subpart M
N/A	13	2.1 A.4.b and c	Added the operation/emission standards and the SSM provision.
12	11	2.1.A.4.d	Added the noncompliance language
11	11	2.1.A.4.e	Updated the language to be consistent with 40 CFR 63.1965.
11-12	14	2.1.A.4.f	Updated the language to be consistent with 40 CFR 63.6(e)(iii).
13	14-15	2.1.A.4.h through j	Updated the recordkeeping and reporting language to be consistent with 40 CFR 63.6(c)(iii), 63.6(c)(iv) and 63.6(c)(v).
14-23	16-25	3	Updated the General Condition to version 5.2.

## 5. Changes in Equipment

There are no changes to permitted emission sources.

Title V Equipment Editor (TVEE) is up-to-date for the changes above as of July 19, 2018.

The facility's permitted emission sources are as follows:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
ES-01 NSPS Subpart WWW MACT Subpart AAAA 40 CFR 61, Subpart M	Municipal solid waste landfill	CD-GCCS1  CD-02	One landfill gas collection and control system including:  One landfill gas-fired open flare (3000 scfm capacity)

The facility's insignificant/exempt activities are as follows:

Emission Source ID No.	Emission Source Description
IES-03A	One leachate storage tank (156,000 gallon capacity)
IES-03B	One leachate storage tank (156,000 gallon capacity)
IES-07	New and used oil storage tanks
IES-08	New and used hydraulic fluid tanks
IES-09	Storage drums (fifty-five gallon capacity)

## 6. NSPS, NESHAP, PSD, 112(r), CAM & Attainment Status

- **NSPS –**

- ✓ The MSW landfill (ID No. ES-01) is subject to 40 CFR 60, Subpart WWW “Municipal Solid Waste Landfills,” since the facility was constructed in 1997 which is after the applicability date of May 30, 1991. Since the landfill has a design capacity equal to or greater than 2.5 million Mg and 2.5 million m<sup>3</sup>, and has demonstrated uncontrolled NMOC emissions equal to or greater than 50 Mg/yr, the facility has installed and operates a gas collection and control system as required.
- ✓ The MSW landfill (ID No. ES-01) is NOT subject to 40 CFR 60, Subpart XXX “Municipal Solid Waste Landfills that Commenced Construction, Reconstruction or Modification after July 17, 2014,” since it has not been reconstructed or modified after July 17, 2014. The landfill will become subject to this subpart upon commencement of construction for the next expansion phase permitted by the NC Division of Waste Management, Solid Waste Section.
- ✓ Engines associated with portable sources (ID Nos. IES-10, IES-11, and IES-12) are NOT subject to 40 CFR 60, Subpart IIII “Stationary Compression Ignition Internal Combustion Engines,” because these engines are not stationary engines.

- **NESHAP –**

- ✓ The MSW landfill (ID No. ES-01) is subject to 40 CFR 63, Subpart AAAA “Municipal Solid Waste Landfills,” because it has a design capacity equal to or greater than 2.5 million Mg and 2.5 million m<sup>3</sup>, and has estimated uncontrolled NMOC emissions equal to or greater than 50 Mg/yr as calculated using the Tier 2 methodology of NSPS Subpart WWW as of 2009. The landfill complies with the requirements of NESHAP Subpart AAAA by complying with the requirements of NSPS Subpart WWW.
- ✓ The MSW landfill (ID No. ES-01) is subject to 40 CFR 61 Subpart M, “National Emission Standard for Asbestos; Standard for Active Waste Disposal Sites” [40 CFR §61.154], since it is an active asbestos waste disposal site as defined in 40 CFR §61.141. A permit condition for this NESHAP has been included in revision T03.
- ✓ Engines associated with portable sources (ID Nos. IES-10, IES-11, and IES-12) are NOT subject to 40 CFR 63, Subpart ZZZZ “Stationary Reciprocating Internal Combustion Engines,” because these engines are not stationary engines.

- **PSD –** The facility’s potential emissions do not exceed PSD permitting thresholds.

- ✓ Person County has triggered increment tracking under PSD for PM<sub>10</sub> and SO<sub>2</sub>. This permit renewal will neither expand nor consume any increments.

- **112(r) –** The facility does not store any of the listed 112(r) chemicals in amounts that exceed the threshold quantities. Therefore, the facility is not required to maintain a written Risk Management Plan (RMP).

- **CAM** – Compliance Assurance Monitoring (CAM) does NOT apply since the sources are regulated by a NSPS and MACT that were proposed after November 15, 1990, and control the pollutants which would be subject to CAM.
- **Attainment status** – Person County is in attainment for all criteria pollutants.

## 7. Regulatory Review

The landfill and its associated control equipment are subject to the following regulations, in addition to the requirements in the General Conditions Permit language has been updated and expanded as needed, but the requirements of the existing stipulations remain essentially unchanged. No regulatory review is required for the regulations listed above, because there are no changes to requirements for these permit conditions since the permit last went through public notice and EPA review.

- 15A NCAC 02D .0516, “Sulfur Dioxide Emissions from Combustion Sources”
- 15A NCAC 02D .0521, “Control of Visible Emissions”
- 15A NCAC 02D .0524, “New Source Performance Standards; 40 CFR 60, Subpart WWW”
- 15A NCAC 02D .1806, “Control and Prohibition of Odorous Emissions”

The following permit conditions have been added or changed:

### **15A NCAC 02D .1110, “National Emission Standards; 40 CFR 61, Subpart M”**

The application states that the landfill accepts asbestos waste, making it subject to the requirements of 40 CFR 61, Subpart M. A permit condition, Attachment 1, is being included for this NESHAP with this revision. Compliance is expected.

### **15A NCAC 02D .1111, “Maximum Achievable Control Technology; 40 CFR 63, Subpart AAAAA”**

The MSW landfill (ID No. ES-01) is the subject source. The facility complies with MACT Subpart AAAAA by complying with NSPS WWW. The permit condition has been updated to include the specific startup, shutdown, and malfunction (SSM) plan requirements, and updated recordkeeping and reporting requirements for the SSM plan. The changes to the permit condition are attached to this review as Attachment 2; no other changes were made. Continued compliance is expected.

## 8. Other Regulatory Requirements

- A Zoning Consistency Determination is NOT required for this permit application.
- A P.E. Seal is NOT required for this permit application.
- There are no application fees required for a permit renewal.

## 9. Emissions Review

Facility-wide potential emissions before control through CY2024 are as follows:

Pollutant (tpy)	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC	Individual HAP (Toluene)	Total HAPs
Source								
Landfill Volume Emissions (ES-01)	--	--	--	--	--	23.94	4.24	12.44
Leachate Tanks (IES-03A & 03B)	--	--	--	--	--	0.68	--	0.68
Total	--	--	--	--	--	24.62	4.24	13.12

Facility-wide potential emissions after control through CY2024 are as follows:

Pollutant (tpy)	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC	Individual HAP (HCl)	Total HAPs
Source								
Landfill Volume Emissions (ES-01)	--	--	--	--	--	5.99	--	3.11
Landfill Gas Collection and Control System & Flare (CD-GCCS1 & CD-02)	6.70	6.70	11.88	27.13	123.67	0.80	3.07	3.50
Leachate Tanks (IES-03A & 03B)	--	--	--	--	--	0.68	--	0.68
Total	6.70	6.70	11.88	27.13	123.67	7.47	3.07	7.29

### Landfill emissions:

Landfill volume emissions were calculated using the methane generation rate of 13,056,009 m<sup>3</sup>/yr from the LandGEM output, and pollutant concentrations from AP-42 Chapter 2.4, November 1998; Section 10 contains an example of these calculations. The NMOC concentration used is 595 ppmv, and VOC emissions are assumed as 39% of NMOC emissions per AP-42 Chapter 2.4, November 1998. Post collection and control potential emissions were calculated by applying a collection efficiency of 75% and a destruction efficiency of 98%.

### Leachate Tank emissions:

These emissions were carried forward from calculations from the T00 permit revision since there have been no modifications to these sources.

### Flare emissions:

Total sulfur emissions were estimated based on hydrogen sulfide emissions, and were calculated using the methodology in AP-42 Chapter 2.4, and assuming a conservative concentration of 100 ppmv. A similar example calculation for hydrogen chloride emissions is in Section 10 below. The flare is assumed to have a control efficiency of 98% for hydrogen sulfide. VOC emissions for the flare are based on the maximum capacity of the flare, regardless of NMOC generation rate from the landfill, and 98% control efficiency.



Particulate, NOx, and CO emissions were calculated using the following emission factors:

PM: 17 lbs/10<sup>6</sup> ft<sup>3</sup> CH<sub>4</sub> (AP-42 2.4-5)

NOx: 0.068 lbs/mmBtu (AP-42 13.5-1 and Manufacturer Guarantee)

CO: 0.31 lbs/mmBtu (AP-42 13.5-2 and Manufacturer Guarantee)

The flare is rated for 91.08 mmBtu/hr at 1,500 ft<sup>3</sup> CH<sub>4</sub> per minute (788.4 million ft<sup>3</sup> CH<sub>4</sub> per year), assuming a heating value of 506 Btu/ft<sup>3</sup>.

Example:

$$\frac{788.4 \text{ million ft}^3 \text{ CH}_4}{\text{year}} \times \frac{17 \text{ pounds PM}}{\text{million ft}^3 \text{ CH}_4} \times \frac{1 \text{ ton}}{2,000 \text{ pounds}} = \frac{6.70 \text{ tons PM}}{\text{year}}$$

All particulate emissions from the combustion of landfill gas are considered as PM<sub>2.5</sub>.

## 10. Air Toxics

The facility has triggered an air toxics demonstration in the past, and submitted a dispersion modeling analysis in 2012 with permit renewal Application No. 7300079.13A. However, since the facility is subject to 40 CFR 63 Subpart AAAA, the permit contains neither a 15A NCAC 02D .1100 nor a 15A NCAC 02Q .0711 toxics condition per NCGS 143-215.107(a)(5) and 15A NCAC 02Q .0702(a)(27).

There is an expected increase in emissions of toxic air pollutants associated with this permit application, since the emission source, the landfill itself, is continuously growing. The landfill's emissions were last evaluated through CY2019, which is the year the current permit revision expires. The facility provided updated estimates of emissions through CY2024, based on the current waste acceptance rate as listed in the Solid Waste Permit, Permit No. 7304, where previous estimations were based on increased acceptance rates that would have exceeded the permitted limit. The facility assumed default values for the collection and destruction efficiencies, 75% and 98% respectively.

Emissions projections were made using LandGEM with default NMOC and pollutant concentrations from the November 1998 revision of AP-42 Table 2.4-1, apart from hydrogen sulfide, for which the facility used 100 ppmv as the concentration rather than the 35.5 ppmv default, stating in a previous application that it is a "conservative industry value." This projection resulted in an estimated LFG generation rate of 26,112,017 m<sup>3</sup>/yr (~1,754 scfm) through CY2024.

The following example calculation is for the emission of hydrochloric acid (HCl) created from the combustion of the chlorine compounds in the landfill gas-fired flare. The best methods to estimate emission are mass balance methods using site specific data on total chloride [expressed in ppmv as the chloride ion (Cl<sup>-</sup>)]. [AP-42, Section 2.4.4.2 – Controlled Emissions]

- Current flare design rating = 3,000 ft<sup>3</sup>/minute (or 84.9 m<sup>3</sup>/min = 5,094 m<sup>3</sup>/hour)
- Methane is only 50% of this gas stream (2,547 m<sup>3</sup>/hour)
- Q<sub>Cl<sup>-</sup></sub> = Emission rate of chloride ions, m<sup>3</sup>/hour
- C<sub>Cl<sup>-</sup></sub> = Concentration of chloride ions (42.0 ppmv, AP-42 default value)
- Multiplication factor for 50% methane concentration in landfill gas = 2.0
- Molecular weight of chloride ions = 35.45 g/mole

$$Q_{Cl^-} = 2.0 \times Q_{CH_4} \times \left( \frac{C_{Cl^-}}{1 \times 10^6} \right) \quad (\text{AP-42, Equation 3})$$

$$Q_{Cl^-} = 2.0 \times 2,547 \frac{m^3}{hour} \times \left( \frac{42.0 \text{ parts}}{1 \times 10^6} \right) = \frac{0.21 m^3}{hour}$$

The mass of the pre-combustion chloride ions present in the methane were found using Equation 4 of AP-42, Section 2.4.4.2.

$$UM_{Cl^-} = \frac{0.21 m^3}{hour} \times \left[ \frac{35.45 \text{ g / gmole} \times 1 \text{ atm}}{\frac{8.205 \times 10^{-5} m^3 - atm}{gmol-K} \times \frac{1,000 \text{ g}}{kg} \times (273 + 25^\circ C) K} \right] \times \frac{2.2 \text{ lbs}}{kg} = \frac{0.68 \text{ lbs (Cl}^-)}{hour}$$

To calculate the HCl from the chloride ions, Equation 10 of Section 2.4-8 was used.

$$HCl_{emissions} = UM_{Cl^-} \times \frac{\eta_{col}}{100} \times 1.03 \times \frac{\eta_{ent}}{100}$$

Where:

$UM_{Cl}$  = Uncontrolled mass emission of  $Cl^-$  ions (0.68 lb  $Cl^-$  ions/hour)

$\eta_{col}$  = Collection efficiency of the landfill gas collection system, percent (75%)\*

$\eta_{ent}$  = Control efficiency of the landfill gas control flare (98%)\*

\* To calculate worst-case HCl emissions, the facility assumes that 100% of the generated  $Cl^-$  ions are collected and converted to HCl.

$$HCl_{emissions} = 0.68 \frac{lb}{hour} \times \frac{100}{100} \times 1.03 \times \frac{100}{100} = 0.70 \frac{lb}{hour}$$

The total emissions of other pollutants from the landfill and flare were calculated using AP-42 Section 2.4-6 Equation 5:

$$CM_p = \left[ UM_p \times \left( 1 - \frac{\eta_{col}}{100} \right) \right] + \left[ UM_p \times \frac{\eta_{col}}{100} \times \left( 1 - \frac{\eta_{ent}}{100} \right) \right]$$

Where:

$CM_p$  = Controlled mass emissions of pollutant

$UM_p$  = Uncontrolled mass emission of pollutant

$\eta_{col}$  = Collection efficiency of the landfill gas collection system, percent (75%)

$\eta_{ent}$  = Control efficiency of the landfill gas control flare (98%)

Example calculation for toxic air pollutant benzene (lb/yr):

Projected emission rate, using Equations 3 & 4, from the landfill for benzene = 350.5 lb/year

$$CM_{benzene} = \left[ 350.5 \frac{lb}{year} \times \left( 1 - \frac{75}{100} \right) \right] + \left[ 350.5 \frac{lb}{year} \times \frac{75}{100} \times \left( 1 - \frac{98}{100} \right) \right] = \frac{92.89 \text{ lb}}{year}$$

The facility provided calculations for flare emissions based on maximum flow rate through the flare, however the projected actual emissions were calculated using the LFG generation rate as estimated by LandGEM, with the exception of HCl which is generated by the flare. The projected actual toxic emissions through CY2024 and comparison to their respective Toxic Permitting Emission Rates (TPERs) from 15A NCAC 02Q .0711(a) are as follows:

Toxic Air Pollutant	Averaging Period	Landfill Volume Emission Rates	Flare Emission Rates	Total	TPER	Modeling Required?
1,1,1-Trichloroethane (methyl chloroform)	lb/day	0.10	$6.19 \times 10^{-3}$	0.11	250	No
	lb/hr	$4.29 \times 10^{-3}$	$2.58 \times 10^{-4}$	$4.55 \times 10^{-3}$	64	No
1,1,2,2-Tetrachloroethane	lb/yr	109.43	6.57	116.0	430	No
1,1-Dichloroethene (vinylidene chloride)	lb/day	0.031	$1.86 \times 10^{-3}$	0.033	2.5	No
1,2-Dibromoethane (ethylene dibromide)	lb/yr	0.11	$6.60 \times 10^{-3}$	0.12	27	No
1,2-Dichloroethane (ethylene dichloride)	lb/yr	23.83	1.43	25.26	260	No
2-Butanone (MEK)	lb/day	0.82	0.049	0.87	78	No
	lb/hr	0.034	$2.06 \times 10^{-3}$	0.036	22.4	No
4-Methyl-2-pentanone (MIBK)	lb/day	0.30	0.018	0.32	52	No
	lb/hr	0.013	$7.53 \times 10^{-4}$	0.014	7.6	No
Acrylonitrile	lb/day	0.54	0.032	0.57	0.4	<b>YES</b>
	lb/hr	0.023	$1.35 \times 10^{-3}$	0.024	0.22	No
Benzene	lb/yr	87.63	5.26	92.89	8.1	<b>YES</b>
Carbon disulfide	lb/day	0.071	$4.27 \times 10^{-3}$	0.075	3.9	No
Carbon tetrachloride	lb/yr	0.36	0.022	0.38	460	No
Chlorobenzene	lb/day	0.045	$2.71 \times 10^{-3}$	0.048	46	No
Chloroform	lb/yr	2.10	0.13	2.23	290	No
p-Dichlorobenzene	lb/hr	$2.07 \times 10^{-3}$	$1.24 \times 10^{-4}$	$2.19 \times 10^{-3}$	16.8	No
Dichlorodifluoromethane	lb/day	3.05	0.18	3.23	5200	No
Dichlorofluoromethane	lb/day	0.43	0.026	0.46	10	No
Dichloromethane (methylene chloride)	lb/yr	713.44	42.81	756.25	1600	No
	lb/hr	0.081	$4.90 \times 10^{-3}$	0.086	0.39	No
Ethyl mercaptan	lb/hr	$9.49 \times 10^{-3}$	$5.70 \times 10^{-4}$	0.010	0.025	No
n-Hexane	lb/day	0.91	0.055	0.97	23	No
Hydrogen Chloride	lb/hr	-----	0.70	0.70	0.18	<b>YES</b>
Hydrogen Sulfide	lb/day	5.48	0.33	5.81	1.7	<b>YES</b>
Mercury (alkyl)	lb/day	$9.42 \times 10^{-5}$	$2.83 \times 10^{-4}$	$3.76 \times 10^{-4}$	$1.3 \times 10^{-3}$	No
Mercury Vapor	lb/day	-----	$5.65 \times 10^{-6}$	$5.65 \times 10^{-6}$	0.013	No
Methanethiol (methyl mercaptan)	lb/hr	$8.03 \times 10^{-3}$	$4.82 \times 10^{-4}$	$8.51 \times 10^{-3}$	0.013	No
Tetrachloroethylene (Perchloroethylene)	lb/yr	363.31	21.80	385.11	13000	No
Toluene	lb/day	5.83	0.35	6.18	98	No
	lb/hr	0.24	0.015	0.26	14.4	No
Trichloroethylene	lb/yr	217.63	13.06	230.69	4000	No
Trichlorofluoromethane	lb/hr	$7.00 \times 10^{-3}$	$4.20 \times 10^{-4}$	$7.42 \times 10^{-3}$	140	No
Vinyl chloride	lb/yr	269.45	16.17	285.62	26	<b>YES</b>
Xylene	lb/day	2.07	0.044	2.11	57	No
	lb/hr	0.086	$5.17 \times 10^{-3}$	0.091	16.4	No

Data regarding previously modeled emissions were retrieved from the modeling analysis submitted in 2012. Impacts at the property boundary vary linearly in relation to the emission rate, so the CY2024 impacts were calculated by scaling up from the initial emission rates.

The following impacts resulted from this analysis:

Toxic Air Pollutant	Averaging Period	Initially Modeled Emission Rates	Initial Model % AAL	Projected Actual Emission Rates Through CY2024	CY 2024 % AAL
Acrylonitrile	lbs/day	0.485	3.79%	0.57	4.5%
Benzene	lbs/yr	79.3	84.2%	92.89	98.6%
Hydrogen chloride	lbs/hr	0.469	0.003%	0.70*	0.004%
Hydrogen sulfide	lbs/day	1.76	0.683%	5.81	2.3%
Vinyl chloride	lbs/yr	245.4	6.31%	285.62	7.3%

\* HCl emission rate is based on the maximum flow rate of the flare, regardless of the LFG generation rate of the landfill

None of the toxic air pollutants evaluated exceed their respective TPER or AAL, therefore, DAQ has determined that there is NOT an unacceptable risk to human health resulting from this modification. Toxic air emissions should periodically be re-evaluated over the life of the landfill as the landfill grows, and future more refined and up-to-date modeling analyses may need to be performed as pollutant emission rates approach the AAL based on older modeling.

## 11. Statement of Compliance

The latest compliance inspection at the facility was conducted by Maureen Conner on December 19, 2017. Ms. Conner found the facility to be operating in apparent compliance with their existing air quality permit.

## 12. Public Notice Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant shall be provided to EPA.

The 30-day public notice period was from MONTH XX through MONTH XX, 2018.

The 45-day EPA review period was from MONTH XX through MONTH XX, 2018.

XX adverse comments were received during the public notice or EPA review periods.

### **13. Comments and Recommendations**

The permit renewal application for Republic Services of North Carolina, LLC dba Upper Piedmont Environmental Landfill located in Rougemont, Person County, NC has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined that this facility is complying or will achieve compliance, as specified in the permit, with all requirements that are applicable to the affected sources. The DAQ recommends the issuance of Air Permit No. 09847T03.

## Attachment 1

### **15A NCAC 02D .1110: NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (40 CFR 61, Subpart M – National Emission Standard for Asbestos)**

- a. The Permittee shall comply with all applicable provisions, including the notification, testing, recordkeeping, and monitoring requirements contained in Environmental Management Commission Standard 15A NCAC 02D .1110 "National Emission Standards for Hazardous Pollutants" as promulgated in 40 CFR Part 61, Subpart M "National Emission Standard for Asbestos", including Subpart A "General Provisions".

#### **Applicability** [40 CFR 61.140 and 61.161]

- b. The municipal solid waste landfill (**ID No. ES-01**) is subject to this provision if the source is considered active waste disposal site. The site is considered active if asbestos-containing waste material has been deposited within the past year.

#### **Testing** [15A NCAC 02Q .0508(f)]

- c. If emission testing is required, the testing shall be performed in accordance with General Condition JJ. If the results of this testing are above the applicable limits in 40 CFR 61.154, the Permittee shall be deemed in noncompliance with 15A NCAC 02D .1110.

#### **Monitoring/Recordkeeping** [15A NCAC 02Q .0508(f), 40 CFR 61.154]

- d. The Permittee shall comply with at least one of the following:
- i. Ensure that there are no visible emissions from any active waste disposal site; OR
  - ii. Use an alternative emissions control method that has received prior written approval by the Administrator according to the procedures described in §61.149(c)(2); OR
  - iii. At the end of each operating day (or at least once every 24-hour period while the site is in continuous operation), the asbestos-containing waste material that has been deposited at the site during the operating day or previous 24-hour period shall:
    - (A) Be covered with at least 15 centimeters (6 inches) of compacted nonasbestos-containing material; OR
    - (B) Be covered with a resinous or petroleum-based dust suppression agent that effectively binds dust and controls wind erosion. Such an agent shall be used in the manner and frequency recommended for the particular dust by the dust suppression agent manufacturer to achieve and maintain dust control. Other equally effective dust suppression agents may be used upon prior approval by the Administrator. For purposes of this paragraph, any used, spent, or other waste oil is not considered a dust suppression agent.
- e. If the Permittee uses an option other than Paragraph d.iii, above, the Permittee shall install signs and barriers that meet the requirements of §61.154(b).
- f. For all asbestos-containing waste material received, the Permittee shall:
- i. Maintain waste shipment records, using a form similar to that shown in Figure 4 of Subpart M, and include the following information:
    - (A) The name, address, and telephone number of the waste generator.
    - (B) The name, address, and telephone number of the transporter(s).
    - (C) The quantity of the asbestos-containing waste material in cubic meters (cubic yards).

- (D) The presence of improperly enclosed or uncovered waste, or any asbestos-containing waste material not sealed in leak-tight containers. Report in writing to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the waste generator (identified in the waste shipment record), and, if different, the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the disposal site, by the following working day, the presence of a significant amount of improperly enclosed or uncovered waste. Submit a copy of the waste shipment record along with the report.
- (E) The date of the receipt.
- ii. As soon as possible and no longer than 30 days after receipt of the waste, send a copy of the signed waste shipment record to the waste generator.
  - iii. Upon discovering a discrepancy between the quantity of waste designated on the waste shipment records and the quantity actually received, attempt to reconcile the discrepancy with the waste generator. If the discrepancy is not resolved within 15 days after receiving the waste, immediately report in writing to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the waste generator (identified in the waste shipment record), and, if different, the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program for the disposal site. Describe the discrepancy and attempts to reconcile it, and submit a copy of the waste shipment record along with the report.
  - iv. Retain a copy of all records and reports required by this paragraph for at least 2 years.
- g. The Permittee shall maintain records of the location, depth and area and quantity in cubic meters (or cubic yards) of asbestos-containing waste material within the disposal site on a map or diagram of the disposal area until closure of the landfill.
- h. Upon closure, the Permittee shall:
- i. comply with all the provisions of §61.151; AND
  - ii. submit a copy of records of asbestos waste disposal locations and quantities.

If the Permittee does not comply with the monitoring and recordkeeping requirements in Paragraphs d. through h., above, the Permittee shall be deemed in noncompliance with 15A NCAC 02D .1110.

**Reporting** [15A NCAC 02Q .0508(f), 40 CFR 61.154(i) and (j)]

- i. Upon request, the Permittee shall provide all records required under this subpart and make available during normal business hours for inspection by the DAQ.
- j. The Permittee shall notify the DAQ regional office in writing at least 45 days prior to excavating or otherwise disturbing any asbestos-containing waste material that has been deposited at a waste disposal site and is covered. If the excavation will begin on a date other than the one contained in the original notice, notice of the new start date must be provided to the DAQ at least 10 working days before excavation begins and in no event shall excavation begin earlier than the date specified in the original notification. Include the following information in the notice:
  - i. Scheduled starting and completion dates.
  - ii. Reason for disturbing the waste.
  - iii. Procedures to be used to control emissions during the excavation, storage, transport, and ultimate disposal of the excavated asbestos-containing waste material. If deemed necessary, the Administrator may require changes in the emission control procedures to be used.
  - iv. Location of any temporary storage site and the final disposal site.

## Attachment 2

### **15A NCAC 02D .1111: MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY (40 CFR 63, Subpart AAAAA – Municipal Solid Waste Landfills)**

- a. For all sources located at this facility, the Permittee shall comply with all applicable provisions contained in Environmental Management Commission Standard 15A NCAC 02D .1111, “Maximum Achievable Control Technology” (MACT) as promulgated in 40 CFR Part 63, Subpart AAAAA, including Subpart A, “General Provisions.”

#### **Operation/Emission Standards** [40 CFR 63.1955]

- b. The Permittee shall meet the requirements of 40 CFR Part 60 Subpart WWW as indicated in Section 2.1 A.3 of this permit in order to comply with 40 CFR Part 63, Subpart AAAAA.
- c. At all times, including periods of startup, shutdown, and malfunction, the Permittee shall operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. During a period of startup, shutdown, or malfunction, this general duty to minimize emissions requires that the owner or operator reduce emissions from the affected source to the greatest extent which is consistent with safety and good air pollution control practices. The general duty to minimize emissions during a period of startup, shutdown, or malfunction does not require the owner or operator to achieve emission levels that would be required by the applicable standard at other times if this is not consistent with safety and good air pollution control practices, nor does it require the owner or operator to make any further efforts to reduce emissions if levels required by the applicable standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to DAQ which may include, but is not limited to, monitoring results, review of operation and maintenance procedures (including the startup, shutdown, and malfunction plan required in paragraph 4.f. of this section), review of operation and maintenance records, and inspection of the source. [40 CFR 63.6(e)]

#### **Monitoring Requirements** [40 CFR 63.1960]

- d. Compliance is determined in the same way it is determined for 40 CFR part 60, subpart WWW, including performance testing, monitoring of the collection system, continuous parameter monitoring, and other credible evidence. In addition, continuous parameter monitoring data, collected under Section 2.1 A.3.n.i and 2.1 A.3.o of this permit, are used to demonstrate compliance with the operating conditions for control systems. If a deviation occurs, the Permittee has failed to meet the control device operating conditions described in this subpart and has deviated from the requirements of this subpart. Finally, the Permittee shall develop a written SSM plan according to the provisions in paragraph f of this section. A copy of the SSM plan must be maintained on site. Failure to write or maintain a copy of the SSM plan is a deviation from the requirements of this subpart.

The Permittee shall be deemed in noncompliance with 15A NCAC 02D .1111 if the monitoring requirements are not met.



- e. For the purposes of the landfill monitoring and SSM plan requirements, deviations include the following:
  - i. A deviation occurs when the control device operating parameter boundaries described in 40 CFR 60.758(c)(1) of Subpart WWW are exceeded.
  - ii. A deviation occurs when 1 hour or more of the hours during the 3-hour block averaging period does not constitute a valid hour of data. A valid hour of data must have measured values for at least three 15-minute monitoring periods within the hour.
  - iii. A deviation occurs when a SSM plan is not developed or maintained on site. [40 CFR 63.1965]

**Startup, Shutdown and Malfunction Plan** [40 CFR 63.6(e)]

- f. The Permittee shall develop a written startup, shutdown, and malfunction plan that describes, in detail, procedures for operating and maintaining the source during periods of startup, shutdown, and malfunction; and a program of corrective action for malfunctioning process, air pollution control, and monitoring equipment used to comply with the relevant standard. The startup, shutdown, and malfunction plan does not need to address any scenario that would not cause the source to exceed an applicable emission limitation in the relevant standard. This plan must be developed by the owner or operator by the source's compliance date for that relevant standard. The purpose of the startup, shutdown, and malfunction plan is to:
  - i. Ensure that, at all times, the owner or operator operates and maintains each affected source, including associated air pollution control and monitoring equipment, in a manner which satisfies the general duty to minimize emissions established by 40 CFR 63.6(e)(1)(i);
  - ii. Ensure that owners or operators are prepared to correct malfunctions as soon as practicable after their occurrence in order to minimize excess emissions of hazardous air pollutants; and
  - iii. Reduce the reporting burden associated with periods of startup, shutdown, and malfunction (including corrective action taken to restore malfunctioning process and air pollution control equipment to its normal or usual manner of operation).

**Recordkeeping/Reporting Requirements** [15A NCAC 02Q .0508(f)]

- g. The Permittee shall keep records and submit reports as described in Section 2.1 A.3.q through y of this permit. [40 CFR 63.1980]. The Permittee shall be deemed in noncompliance with 15A NCAC 02D .1111 if these recordkeeping and reporting requirements are not met.
- h. When actions taken by the Permittee during a startup or shutdown (and the startup or shutdown causes the source to exceed any applicable emission limitation in the relevant emission standards), or malfunction (including actions taken to correct a malfunction) are consistent with the procedures specified in the affected source's startup, shutdown, and malfunction plan, the Permittee shall keep records for that event which demonstrate that the procedures specified in the plan were followed. These records may take the form of a "checklist," or other effective form of recordkeeping that confirms conformance with the startup, shutdown, and malfunction plan and describes the actions taken for that event. In addition, the Permittee shall keep records of these events as specified in paragraph 63.10(b), including records of the occurrence and duration of each startup or shutdown (if the startup or shutdown causes the source to exceed any applicable emission limitation in the relevant emission standards), or malfunction of operation and each malfunction of the air pollution control and monitoring equipment. Furthermore, the Permittee shall confirm that actions taken during the relevant reporting period during periods of startup, shutdown, and malfunction were consistent with the affected source's startup, shutdown and malfunction plan in the semiannual startup, shutdown, and malfunction report required in §63.10(d)(5). [40 CFR 63.6(e)(3)(iii)]

- i. If an action taken by the Permittee during a startup, shutdown, or malfunction (including an action taken to correct a malfunction) is not consistent with the procedures specified in the affected source's startup, shutdown, and malfunction plan, and the source exceeds any applicable emission limitation in the relevant emission standard, then the Permittee shall record the actions taken for that event and shall report such actions within 2 working days after commencing actions inconsistent with the plan, followed by a letter within 7 working days after the end of the event, in accordance with §63.10(d)(5) unless the owner or operator makes alternative reporting arrangements, in advance, with the DAQ. [40 CFR 63.6(c)(iv)]
- j. The Permittee shall maintain at the affected source a current startup, shutdown, and malfunction plan and shall make the plan available upon request for inspection and copying by the DAQ. In addition, if the startup, shutdown, and malfunction plan is subsequently revised as provided in paragraph c of this section, the Permittee shall maintain at the affected source each previous (i.e., superseded) version of the startup, shutdown, and malfunction plan, and shall make each such previous version available for inspection and copying by the DAQ for a period of 5 years after revision of the plan. [40 CFR 63.6(c)(v)]